# Introducing RDTs in different health sectors: interventions and impact in ACT Consortium studies

Mon 7 Oct, 09.30-11:00

**Chairs: Clare Chandler and Evelyn Ansah**

## OVERVIEW

**Objective:** This symposium will present findings from across ACT Consortium studies that have evaluated the impact of introducing RDTs using different implementation strategies in different health sectors.

**Rationale:** The challenges of ensuring valuable ACT antimalarials reach those who need them and are not taken in the absence of malaria parasitaemia are now well known. To address the overuse of antimalarials and improve patient care, WHO guidelines for malaria case management were updated in 2010 to recommend parasitaemic confirmation of all cases treated as malaria where possible. This has been made possible by the advent of Rapid Diagnostic Tests (RDTs) for malaria. RDTs have now been suggested to be introduced across different types of health care practitioner, from community health workers, to drug shops, to public health centres to hospitals. While the potential for RDTs to improve case management in these different arenas stands in theory, in practice researchers have reported mixed results of their uptake and of adherence to test results.

**Content:** The ACT Consortium is a global research partnership of 25 projects working in 10 malaria endemic countries to tackle questions relating to access, targeting, safety and quality of ACTs. In this symposium, we will be presenting findings from four projects that have designed and evaluated novel interventions to support the introduction of RDTs in different health sectors. Each project invested significant time in formative research to understand existing behaviours in relation to diagnostics, and undertook careful design of supporting interventions to maximise RDT uptake and adherence. Each project utilised rigorous randomised controlled trial methods to evaluate the impact of RDTs under different conditions and supporting interventions. Panelists will present results from different health sector and country contexts to show what supporting interventions were effective, and to show the impact of introducing RDTs on uptake of tests, adherence to results and treatment of RDT negative cases and patient level outcomes. The symposium will finish with a chaired discussion with audience members to discuss how and where RDTs may be most appropriate to scale-up, and what impacts may be expected with such scale-up in different sectors.

1. **Introduction *(5 min)***

**Presenter:** **Evelyn Ansah** *(Ghana Health Service, Ghana)*

2. **Prescriber use of RDT results in primary and secondary care in Tanzania: findings from an observational study and a three-arm cluster randomised trial *(15 min)***

**Presenter:** **Hugh Reyburn** *(London School of Hygiene & Tropical Medicine, UK)*

Team: Bonnie Cundill, Hilda Mbakilwa, George Mtove, Frank Mtei, Annie Willetts, Clare Chandler, Harry Mwerinde, Sia Msuya, Oscar Mafole, Florida Muro, Renata Mandike, Rahim Mwinyishehe, Raimos Olomi, Chris Whitty, Hugh Reyburn

A number of studies have demonstrated the preference for a diagnosis of malaria in Africa even in the face of negative parasitological test results and this threatens the success of the roll out of malaria rapid diagnostic tests (RDTs).

We conducted a 3-arm cluster randomised trial of interventions to improve prescriber practices with RDTs in 36 basic health facilities in NE Tanzania. All staff received the 2-day Ministry of Health (MOH) training in use of RDTs and intervention arms received 3 additional small group training sessions and a third arm received this in addition to the provision of patient leaflets. In the second half of the trial SMS feedback of prescribing and motivational messages were added.

Prior to the intervention, 37% of patients received an antimalarial drug and this fell to 753/8,975 (8%), 1250/10,147(3%) and 250/10,190(2%) in control, training and training plus leaflets arms respectively ($p<0.001$). A small additional effect was attributed to the use of SMS motivational messages (=0.02) but not feedback of prescribing results ($p=0.08$).

It appears that health staff are becoming more responsive to basic training messages on the use of RDTs, probably the result of increasing levels of trust in test results and a growing awareness of the likelihood of malaria.

In a separate study we compared the results of blood slides with RDT (Paracheck) results in children admitted to hospital for severe febrile illness. Of 3,639 children in the study 2,195 (60.3%) were slide-positive. The sensitivity and specificity of Paracheck were 97.5% (95% CI 96.9-98.0) and 65.3% (95% CI 63.8-66.9) respectively. There was an inverse relationship between age-specific prevalence of parasitaemia and the specificity of Paracheck and this was likely to be due to persistence of HRP2 following recent clearance of parasites.

The combination of a positive Paracheck and negative blood slide result identified a group of children at risk of bacterial infection. While Paracheck was highly sensitive, the tests failed to detect a small number of high-density infections. At high levels of malaria transmission caution should be used in restricting antimalarial treatment to children with a single negative parasitological test.

### 3. Effectiveness of provider and community interventions for the treatment of uncomplicated malaria in Enugu state, South-eastern Nigeria *(15 min)*

**Presenter:** **Obi Onwujekwe** *(College of Medicine, University of Nigeria)*

Team: Wiseman V, Ezeoke O, Nwala E, Mangham LJ, Cundill B, Enemuo J, Uchegbu E, Uzochukwu B, Onwujekwe O.

There is increasing interest in the use of parasitological testing for malaria case management in Nigeria. A formative survey for this study found that less than 1% of patients were tested for malaria. ACTs were received by only 22.4% of all patients and 37.9% of patients received SP. This study hence examined the effectiveness of interventions for improving the diagnosis and treatment of uncomplicated malaria amongst febrile patients attending public healthcare centres, patent medicine dealers (PMDs) and pharmacies (private).

The interventions were evaluated using a three-arm cluster randomized trial. The three arms were: the Control, with supply of rapid diagnostic tests (RDTs) with basic instruction; Intervention arm 1, with an interactive provider intervention and supply of RDTs; and Intervention arm 2, which was the provider intervention from arm 1 plus a school-based community intervention. There were some contextual differences in the interventions across different types of providers and clusters. The interventions were evaluated using a patient exit survey, log of malaria tests conducted, provider survey and a household survey. Data collection commenced approximately three months after the interventions were implemented. The primary outcome measure was the proportion of patients that reported a fever or suspected malaria and received treatment according to malaria guidelines. There were several secondary outcome measures.

This presentation will focus on the design and implementation of the provider and school based interventions. We will also discuss the logic model underpinning this study, which illustrates the expected effect of the interventions on the treatment received by patients. Primary and secondary outcomes will be presented. In summary, there was a relative general increase in testing compared to formative study, but the number of patients that were tested was still low across the three different arms despite the availability of RDTs in the facilities.

## 4. Factors influencing RDT uptake, adherence, treatment and referral by community medicine distributors: findings from a community randomised trial in Uganda *(15 min)*

**Presenter:** **Anthony K. Mbonye** *(Dept. of Community Health, Ministry of Health, Kampala, Uganda)*

Team: Anthony K. Mbonye, Richard Ndyomugyenyi, Pascal Magnussen, Clare I.R. Chandler , Sham Lal, Eleanor Hutchinson, Kristian S. Hansen, Sian E. Clarke

Universal access to diagnostic testing for malaria is recommended by WHO, to encompass all treatment providers. Community-based strategies which aim to increase access to malaria treatment should also aim to promote the use of malaria rapid diagnostic tests (mRDTs) prior to treatment. Two key approaches where mRDTs could be introduced are (1) into community case management for children under 5 years and (2) at drug shops, where malaria treatment is often purchased, for all age groups. Yet limited evidence exists on the effectiveness or cost-effectiveness of mRDTs with different types of health care provider, or how this may vary in different transmission settings.

Three cluster randomised trials were undertaken to address this gap, comparing mRDT use with existing practice of presumptive treatment, including two large scale trials introducing mRDTs to community medicine distributors, in a high and a low malaria transmission setting in rural Western Uganda, and a third trial in 65 registered drug shops in Central Uganda. All providers in all arms received a package of training and job aids on communication skills, clinical algorithms to diagnose and treat malaria, identification of signs requiring referral to health facilities and record keeping. Providers randomised to mRDT clusters were also given training on how to perform, interpret an mRDT and prescribe artemisinin-based combination therapy (ACTs) based on the test's result. Supporting interventions included activities to raise community awareness to emphasise that not all fevers are malaria, and that blood tests can confirm malaria before treatment.

High levels of provider adherence to RDT results were observed in all three trials, resulting in marked improvement in the targeting of malaria treatment in all settings. This talk will outline the design of the interventions with providers and other supporting interventions. Drawing on evidence from the trials, pre-intervention formative research, and post-intervention interviews with patients and providers, we shall discuss enabling factors that may have helped support mRDT introduction in Uganda, and compare and contrast findings across the different provider and transmission settings.

5. **Could treatment outcomes be a barrier to effective implementation of test-based management of malaria in under-five children in rural Ghana?** ***(15 min)***

**Presenter:** **Frank Baiden** *(Kintampo Health Research Centre, Kintampo)*

Team: Frank Baiden, Jayne Webster, Seth Owusu-Agyei, Daniel Chandramohan

World Health Organization guidelines now require that all cases of malaria be confirmed through test before treatment is started. This presentation derives from lesson learnt in deploying test-based management of malaria in 32 health centres and 1 district hospital in the Brong Ahafo Region of Ghana. We used a mixed methods approach to evaluate treatment outcomes for malaria and non-malaria febrile illnesses managed using the revised approach, assessed adherence to current guidelines for the management of under-five childhood illnesses as proxy indicator of health worker adherence to the new policy and assessed the acceptability of the revised guideline to caregivers. Treatment outcomes for malaria and non-malaria febrile illnesses differ significantly in terms of recovery from fever, anemia and in caregiver perception of treatment outcomes, with relatively poorer outcomes for children with non-malaria fevers. Health worker adherence to current guidelines is poor. Respiratory rate is checked in only 4% of children. Out of the 11 required tasks, it is in only 35% of children that more than 6 tasks are performed. All 11 tasks were performed in only 1% of children. Caregiver acceptance of test-based treatment of malaria is however high (98% of caregivers). Factors that promote caregiver acceptability include the perception that blood test represents improvement in the quality of care and is likely to lead to improved treatment outcomes. Implementation of the revised guidelines in rural Ghana is likely to be bolstered by high caregiver acceptability, but undermined by poor health worker adherence to guidelines. Any perception that it leads to poorer treatment outcomes for children with non-malaria fevers could undermine acceptability. Improvement in the management of non-malaria fevers is important for effective implementation of the new policy.

6. **Questions and interactive discussion** ***(25 min)***

**Presenter:** **Clare Chandler** *(London School of Hygiene & Tropical Medicine, UK)*